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10/581,858	06/30/2006	Takanori Itou	040302-0569	4646

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EXAMINER	
LEONG, JONATHAN G	

ART UNIT	PAPER NUMBER
1725	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,858	ITOU ET AL.	
	Examiner	Art Unit	
	JONATHAN G. LEONG	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 September 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6,11 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6, 11, and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/23/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Interpretation

1. Claim 1 contains the claim limitation "whereby gas generation by the decomposition of the electrolysis solution is suppressed". The "decomposition" is taken to have received antecedent basis from the previous claim limitation "whereby the lithium compound prevents oxygen radicals being released from the surface of the oxide from decomposing an electrolysis solution".

Claim Objections

2. Applicant is advised that should claim 1 be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 6, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagayama (JP H07-245105, see Machine Translation).

Regarding claims 1, 6, and 11, Nagayama discloses a non-aqueous electrolyte lithium ion battery ([0001], Drawing 2), comprising: a positive electrode active material layer (cathode active material, [0001]) comprising: an oxide containing lithium and nickel

([0010]); and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide ([0010]), the lithium compound comprising lithium carbonate ([0010]); a negative electrode active material layer comprising a negative electrode active material ([0014]); and an electrolyte layer disposed between the positive and negative electrode active material layers ([0015]). Nagayama further discloses that the lithium compound covering the cathode active material decreases the contact surface of the cathode active material diminishing the decomposition of the electrolyte solution ([0022]). While Nagayama does not explicitly disclose that the lithium compound prevents oxygen radicals being released from the surface of the oxide from decomposing an electrolysis solution; and gas generation by the decomposition of the electrolysis solution is suppressed, it is noted that once an oxide containing lithium and nickel is disclosed to have a lithium compound (e.g. lithium carbonate) deposited on a surface of the oxide containing lithium and nickel (see Nagayama, [0010]), and therefore is substantially the same as the positive electrode material as claimed, it will, inherently, display the recited functional properties (MPEP 2112).

5. Claims 1, 6, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto et al. (US 5427875).

Regarding claims 1, 6, and 11, Yamamoto discloses a non-aqueous electrolyte lithium ion battery (Abstract, Fig. 1), comprising: a positive electrode active material layer (C4/L11-14) comprising: an oxide containing lithium and nickel (C4/L11-14); and a lithium compound deposited on a surface of the oxide, the lithium compound covering

nickel present on the surface of the oxide (Abstract), the lithium compound comprising lithium carbonate (Abstract); a negative electrode active material layer comprising a negative electrode active material (C4/L25-35); and an electrolyte layer disposed between the positive and negative electrode active material layers (C4/L36-47, Fig. 1). While Yamamoto does not explicitly disclose that the lithium compound prevents oxygen radicals being released from the surface of the oxide from decomposing an electrolysis solution; and gas generation by the decomposition of the electrolysis solution is suppressed, it is noted that once an oxide containing lithium and nickel is disclosed to have a lithium compound (e.g. lithium carbonate) deposited on a surface of the oxide containing lithium and nickel (see Yamamoto, C4/L11-14, Abstract), and therefore is substantially the same as the positive electrode material as claimed, it will, inherently, display the recited functional properties (MPEP 2112).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (JP H07-245105, see Machine Translation), as applied to claim 1 above.

Regarding claim 2, Nagayama discloses all of the claim limitations as set forth above. Nagayama further discloses the lithium compound is deposited to cover substantially an entire surface of the oxide (Drawing 1, [0010]), thickness of a cover layer of the lithium compound ranges from 1-10nm (10-100Å, [0011]). While Nagayama does not explicitly disclose the specific range of 5nm to 1μm, it would have been

obvious to one having ordinary skill in the art at the time of the invention to have selected the overlapping portion of the range disclosed by Nagayama because selection of overlapping portion of ranges has been held to be a *prima facie* case of obviousness. *In re Malagari*, 182 USPQ 549 (see also: MPEP 2144.05).

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5427875), as applied to claim 1 above.

Regarding claim 3, Yamamoto discloses all of the claim limitations as set forth above. Yamamoto further discloses the lithium compound is deposited to sprinkle on the surface of the oxide in an amount of 0.5 to 15 wt% with respect to that of the positive electrode active material (Abstract). While Yamamoto does not explicitly disclose the specific range of 0.5 to 10 vol%, it would have been obvious to one having ordinary skill in the art at the time of the invention to have selected the overlapping portion of the range disclosed by Yamamoto because selection of overlapping portion of ranges has been held to be a *prima facie* case of obviousness. *In re Malagari*, 182 USPQ 549 (see also: MPEP 2144.05).

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (JP H07-245105, see Machine Translation) or Yamamoto et al. (US 5427875), as applied to claim 1 above, in view of Huang (US 2003/0157409).

Regarding claim 12, both Nagayama and Yamamoto disclose all of the claim limitations as set forth above. Neither Nagayama nor Yamamoto explicitly disclose the lithium compound is lithium sulfate. However, it is well-known in the art that lithium carbonate (as disclosed by Nagayama: [0010] and Yamamoto: Abstract) and lithium

sulfate are common choices as lithium compounds for use with positive active materials as evidenced by Huang (Claim 5). Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention to use lithium sulfate instead of lithium carbonate to cover the oxide containing lithium and nickel as disclosed by both Nagayama and Yamamoto individually above since one having ordinary skill in the art at the time of the invention would have had reasonable expectation of success in doing so as evidenced by Huang (Claim 5). Additionally, as long as the lithium compound covers the oxide containing lithium and nickel, one having ordinary skill in the art at the time of the invention would have reasonably expected a success of inhibition of decomposition of the electrolyte solution since the contact surface of the oxide containing lithium and nickel is decreased (see Nagayama [0022]).

10. Claims 1, 2, 3, 6, 11, and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Mao et al. (US 6071649) in view of Huang (US 2003/0157409), as evidenced by Nagayama (JP H07-245105, see Machine Translation).

Regarding claims 1, 6, 11, and 12, Mao discloses a non-aqueous electrolyte lithium ion battery (C1/L12-15), comprising: a positive electrode active material layer (C2/L19-20) comprising: an oxide containing lithium and nickel (C2/L50-55); and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide (C2/L55-59), the lithium compound comprising $LiCoO_2$ (C2/L59); a negative electrode active material layer comprising a

negative electrode active material (C2/L25-31); and an electrolyte layer disposed between the positive and negative electrode active material layers (C2/L38-46).

While Mao does not explicitly disclose the lithium compound is one selected from the group listed in instant claim 1, it is well-known in the art that $LiCoO_2$ (C2/L59) and lithium sulfate are common choices as lithium compounds for use with positive active materials as evidenced by Huang (Claim 5). Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention to use lithium sulfate instead of $LiCoO_2$ to cover the oxide containing lithium and nickel as disclosed by Mao since one having ordinary skill in the art at the time of the invention would have had reasonable expectation of success in doing so as evidenced by Huang (Claim 5). Additionally, as long as the lithium compound covers the oxide containing lithium and nickel, one having ordinary skill in the art at the time of the invention would have reasonably expected a success of inhibition of decomposition of the electrolyte solution since the contact surface of the oxide containing lithium and nickel is decreased (as evidenced by Nagayama [0022]).

While modified Mao does not explicitly disclose that the lithium compound prevents oxygen radicals being released from the surface of the oxide from decomposing an electrolysis solution; and gas generation by the decomposition of the electrolysis solution is suppressed, it is noted that once an oxide containing lithium and nickel is disclosed to have a lithium compound (e.g. lithium sulfate) deposited on a surface of the oxide containing lithium and nickel (see Mao: C2), and therefore is

substantially the same as the positive electrode material as claimed, it will, inherently, display the recited functional properties (MPEP 2112).

Regarding claims 2 and 3, modified Mao discloses all of the claim limitations as set forth above. Mao further discloses that as the amount of coating increases, the charge efficiencies increased but the initial capacities decreased (C4/L45-47). While modified Mao does not explicitly disclose the lithium compound is deposited to cover substantially an entire surface of the oxide, thickness of a cover layer of the lithium compound ranges from 5nm to 1μm; the lithium compound is deposited to sprinkle on the surface of the oxide, a volume of the lithium compound ranges from 0.5 to 10% with respect to that of the positive electrode active material, the relative amount of surface coverage, thickness of a cover layer, and volume % of the lithium compound all relate to a general relative amount of lithium compound. Thus, the amount of the lithium compound would have been considered a result effective variable by one having ordinary skill in the art at the time of the invention as evidenced by Mao (C4/L45-47). As such, without showing unexpected results, the claimed surface coverage, thickness of cover layer, and volume % of the lithium compound cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the surface coverage, thickness of cover layer, and volume % of the lithium compound in the positive electrode material of modified Mao to obtain the desired balance between the charge efficiencies and the initial capacities (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior

art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223) (MPEP 2144.05).

Response to Arguments

11. Applicant's arguments filed 9/27/2010 have been fully considered but they are not persuasive.

Applicant argues unexpected results by citing Figs. 10-13 of the original instant specification.

The Examiner is not persuaded by this evidence and considers applicant's showing of unexpected results to be deficient in at least the following respects. First, the relatively narrow scope of the cited examples in Figs. 10-13 fails to adequately represent the broad scope of the rejected claims, that is, the specific examples are not commensurate in scope with the claims. Second, the comparative examples in Figs. 10-13 fail to adequately represent the prior art since the comparative examples lack a lithium compound coating while the prior art has a lithium compound coating (see at least paragraph 10 above).

Applicants further argue that there is no discussion in Huang at all about the use of a lithium compound to suppress swelling by suppressing oxygen radicals being released from the surface of the oxide, which tend to decompose the electrolysis solution, thereby suppressing gas generation by the decomposition of the electrolysis solution.

The Examiner respectfully submits that "suppress swelling" is not, in fact, claimed. Although the claims are interpreted in light of the specification, limitations from

the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner further submits that while Mao does not explicitly disclose the lithium compound is one selected from the group listed in instant claim 1, it is well-known in the art that $LiCoO_2$ (C2/L59) and lithium sulfate are common choices as lithium compounds for use with positive active materials as evidenced by Huang (Claim 5). Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention to use lithium sulfate instead of $LiCoO_2$ to cover the oxide containing lithium and nickel as disclosed by Mao since one having ordinary skill in the art at the time of the invention would have had reasonable expectation of success in doing so as evidenced by Huang (Claim 5). Additionally, as long as the lithium compound covers the oxide containing lithium and nickel, one having ordinary skill in the art at the time of the invention would have reasonably expected a success of inhibition of decomposition of the electrolyte solution since the contact surface of the oxide containing lithium and nickel is decreased (as evidenced by Nagayama [0022]).

While modified Mao does not explicitly disclose that the lithium compound prevents oxygen radicals being released from the surface of the oxide from decomposing an electrolysis solution; and gas generation by the decomposition of the electrolysis solution is suppressed, it is noted that once an oxide containing lithium and nickel is disclosed to have a lithium compound (e.g. lithium sulfate) deposited on a surface of the oxide containing lithium and nickel (see Mao: C2), and therefore is

substantially the same as the positive electrode material as claimed, it will, inherently, display the recited functional properties (MPEP 2112).

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN G. LEONG whose telephone number is (571) 270-1292. The examiner can normally be reached on M-Th 8:00 AM - 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. L./
Examiner, Art Unit 1725
10/13/2010

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1725